## REMARKS/ARGUMENTS

### I. The Currently Claimed Invention

As currently claimed, the invention is a power transmission belt for a motor vehicle and presenting V-ribs made of a single elastomer material and having flat side faces and rounded ridges, wherein said ridges present a convex curvilinear profile having a mean radius of curvature greater than 1 mm and less than or equal to 1.5 mm. Applicants have identified the problem of free zone swelling deformation, which leads to cracking, and how to remedy the problem. Prior to the currently claimed invention, the problem of free zone swelling was not recognized. In fact, prior to the Applicant's identification of the problem of free zone swelling deformation, there was no incentive in the prior art to determine a mean radius of curvature of belt ridges to obtain a satisfactory performance in view of stresses due to (1) swelling and (2) flexing. Thus, unlike belts known in the prior art, the currently claimed belt allows an improved behavior of a belt faced with flexing phenomena while also improving the behavior relative to swelling that generates cracking at the ridges of the belt. In other words, no prior art belt is capable of meeting these two requirements at the same time. As such, belts according to the currently claimed invention exhibit an increased lifetime.

### II. Rejections under 35 U.S.C. §103(a)

To establish a prima facie case of obviousness there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. Furthermore, the teaching or suggestion to make the claimed invention must be found in the prior art, not in applicant's disclosure. The Office has not proven a *prima facie* case of obviousness because neither the references cited nor the knowledge generally available in the art provides any suggestion to modify or combine the prior art in the manner suggested by the Office.

#### a. Rejections based on White in view of Kitahama

Claims 1-12 and 15-17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent No. 4,981,462 to White et al. (hereinafter "White") in view of US Patent No.

4,904,232 to Kitahama et al. (hereinafter "Kitahama). The Office acknowledges that White fails to disclose the claimed ridge radius. In an attempt to cure the deficiency of White, the Office relies on Kitahama for teaching an inner portion having a radius from 0.5 to 1.1 mm.

White teaches an endless power transmission belt construction having opposed side edges and having an inner surface of a single elastomeric material defining a plurality of longitudinally disposed and alternately spaced apart like projections and grooves for meshing with an outer peripheral ribbed surface of a rotatable pulley; wherein each projection of the belt construction has a generally V-shaped transverse cross-sectional configuration defined by two substantially straight side edges that converge from the respective apexes of the grooves of the belt construction that are on opposite sides of that projection to an apex of that projection.

White teaches that the side edges of each projection of the belt construction define an angle of approximately 60 degrees therebetween with the thickness of the belt construction being substantially the same as the thickness of a similar belt construction wherein the angle is approximately 40 degrees. In particular, White teaches that the angle between the side edges of each V-rib should be approximately 60 degrees while maintaining the same thickness as prior art belt constructions having an included angle of 40 degrees to reduce belt noise. White teaches that the accumulation of material between the ribs will reduce tension decay of the belt construction. See column 1, line 67 through column 2, line 7.

Unlike White, Kitahama discloses that belts having compression sections comprising a single material, such as those taught by White, form cracks extending outwardly from the distal end of the ribs. Accordingly, Kitahama teaches a ribbed belt including inner and outer compression portions made from different rubber materials. Specifically, Kitahama teaches that "[i]t is preferred that the difference between the hardness of the two portions 16 and 17 be at least 5° Shore A." See column 3, lines 35-37. On column 1, lines 38-56, Kitahama states the following:

> The present invention comprehends the provision of such a multiribbed power transmission belt including an outer portion having a plurality of transversely spaced, longitudinally extending tensile cords embedded therein, a fabric cover on an outer surface of the outer portion of the belt, a compression section extending inwardly from said outer portion and defining a plurality of laterally spaced, longitudinally extending

> ribs, **each rib having an outer portion formed of a first rubber material** and defining inwardly converging planar opposite side surfaces for engaging complementary pulley groove side surfaces, and **an inner portion formed of a second rubber having a hardness less than the hardness of the outer portion** and defining inwardly converging arcuate opposite side surfaces and an inner tip portion, the outer portion planar side surfaces being tangent to the inner portion arcuate side surfaces respectively at a junction of the outer and inner portions of the compression section ribs.

Kitahama teaches that belts having a compression section comprising an outer compression section and an inner compression section wherein the inner compression section is made of a softer material than that of the outer compression section exhibit a substantially greater useful life. See Column 4, lines 39-53 and Figures 7-9. Specifically, Figure 9 illustrates that belts having the distal end of the ribs formed of a softer rubber than that of the outer portion (i.e. belts according to Figure 8) outperform belts having ribs formed of a single material. See column 4, lines 32-49.

Having demonstrated the superiority of belts with ribs formed from two different materials, Kitahama teaches that the tip geometry of these particular belts can be further improved by constructing the inner portion of the compression section (i.e. the softer material) to have circular side surfaces. Figure 6 illustrates the improvement in performance achieved by utilizing circular side surfaces for the inner portion of the compression section. As shown on Figure 11, Kitahama illustrates that the lifetime ratio increases by increasing the radius of the inner portion of the compression section (i.e. the softer material). Furthermore, Kitahama, on column 6, lines 7-11, teaches that "the provision of the arcuate inwardly converging surfaces of the inner portion of the compression section avoid contact thereof with the pulley surfaces, thereby uniformly dispersing stress in the ribs so as to provide the improved crack resistance and wear characteristics." Kitahama teaches using softer rubber to form the tip or inner portion of the ribs so that the cracks tend to form in the outer portion of the ribs that are made of harder rubber. See column 4, lines 39-49. Thus, the tip geometry described by Kitahama was arrived at due to the use of two different materials to form the ribs of the belt, wherein the inner portion (i.e. the tip portion) is made from a softer material than an outer portion. Further, Kitahama does

not provide a single indication that such geometrical manipulations could be extrapolated to conventional belts having ribs formed from a single material.

Since White fails to teach a belt having the currently claimed geometry, the Office proposes combining White, a belt having ribs formed from a single material, with a belt requiring ribs formed from two different materials (i.e. Kitahama), wherein the geometry of the belt was capable of being modified due to the multi-material rib construction. The skilled artisan, after reading both White and Kitahama, would not be motivated to combine these reference teachings, especially in the manner proposed by the Office. As merely one example, one skilled in the art would not be motivated to modify the belt configuration of White with the tip radius of the Kitahama belt simply because the dimensions of the Kitahama belt are a consequence of using two distinct and different materials to form the ribs of the belt. Thus, the Kitahama rib tip dimensions would not appear to be suitable for belts having single material ribs such as White.

Further, Kitahama does not provide any suggestion that the belt geometry derived from utilizing multiple materials for forming the ribs of a belt would be suitable for belts having ribs formed from a single material. In fact, Kitahama teaches the opposite. First, Kitahama demonstrates the superiority of multi-material ribbed belts over single material ribbed belts, such as described in White. Second, Kitahama teaches that a further advantage of multi-material ribbed belts is that the geometry of the inner section, being the softer of the two, can be manipulated to further improve the performance of such a belt. Without the utilization of two distinct and different materials for forming the ribs of the belt, the geometrical tip changes described in Kitahama made no sense. In fact, Kitahama is specific of this feature, and Kitahama's teaching as to the geometrical change of the ribs makes sense only if there exists a softer rubber in the inner portion 17 of the ribs.

The Office proposes combining White and Kitahama, in the manner such that a resulting belt would have a compression section formed of a single elastomeric material. However, to combine White and Kitahama in the manner suggested by the Office requires blatant disregard for the teachings of Kitahama. Upon reading Kitahama the skilled artisan would clearly not be motivated to retain the single elastomeric material rib construction of White, much less while

also only selecting the tip geometry of Kitahama to form a ribbed belt. The skilled artisan would not be motivated to make such a calculated combination because Kitahama specifically shows that one of the advantages of using a compression section having an outer and inner portion of different materials is an increased life ratio (See column 4, lines 44-46 and Figure 9). Accordingly, Kitahama provides an overwhelmingly convincing showing that single material ribbed belts such as White are significantly inferior. One skilled in the art would clearly not be motivated to retain an inferior design aspect (i.e. ribs formed from a single material) when presented with a superior alternative (i.e. ribs formed from two different materials). As such, Kitahama undoubtedly teaches away from White, and thus the combination of the two references.

Furthermore, the purpose of the curvature of the inner portion 17 of the ribs in Kitahama is to avoid contact with the pulley to minimize wear. See column 1, lines 25-32. Thus, it is clear that Kitahama teaches a means to avoid cracks in the ribs of a belt when reversely bent in a drive system, only when the ribs are made of two different materials, the softer one being on the inside portion or tip of the ribs. Accordingly, Kitahama acknowledges the fact that he cannot provide a solution with a rib made of a single rubber material.

After reading Kitahama, one skilled in the art would be impelled to steer away from using only one material of construction for the compression section of such belts. As discussed on column 6, lines 7-11, Kitahama's geometrical change of the ribs makes sense only if a softer rubber in the inner portion 17 of the ribs is utilized. As such, the teaching of Kitahama cannot apply to a belt where the ribs are made of a single elastomeric material, because on the one hand, such a belt is known as having undesirable crack formation, and on the other hand, it is devoid of the problem of wear which is found in belts with ribs having an internal portion 17 with a softer rubber, and which Kitahama aims at solving. Therefore, Kitahama teaches away from such a combination, and White in view of Kitahama fails to provide a *prima facie* case of obviousness that is necessary for a proper rejection of Claims 1-12 and 15-17.

The Office also argues that Kitahama discloses a belt having a rib height (H) of 2.5 mm, an inner portion of 0.8 mm, and a flat side face ($\ell$) of 1.73 mm. However, the Office ignores the fact that the inner portion dimension of 0.8 mm is drawn from an example describing a 900 mm

belt (column 4, lines 59-62) and the H dimension is drawn from a separate example discussing a completely different belt, namely a 975 mm belt (column 5, lines 36-40). The Office fails to provide any support for why a skilled artisan would be motivated to selectively pick one dimension from a 900 mm belt and a second dimension from a 975 mm belt. Kitahama provides no support for such intermixing of belt dimensions as proposed by the Office. Likewise, White does not provide the necessary motivation. Consequently, the cited references fail to teach or suggest a belt having the currently claimed dimensions. Therefore, the only plausible explanation or motivation for selectively picking and choosing dimensions from different belts is reliance upon the Applicants' current disclosure. Clearly, the values were selected on the sole basis of attempting to reconstruct the currently claimed invention based on Applicants' own disclosure, which is not permitted.

In addition, the range of values for the curvature of the top of the ribs in Kitahama (0.5 mm – 1.1mm) is not the same as the currently claimed invention. Neither Kitahama, White, nor any combination thereof teach or suggest a mean radius of curvature of 1.15 mm (claim 10) nor a mean radius of curvature from 1.15 mm to 1.25 mm (claim 15), as currently recited. Therefore, the cited references do not teach or suggest each and every element of the currently claimed invention. Consequently, the cited references fail to provide a *prima facie* case of obviousness. Applicants request withdrawal of these rejections.

**b. Rejections under the combination of Kitahama and White in view of Waugh**

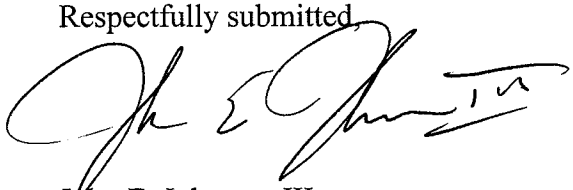
Claims 13 and 14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of White and Kitahama, and further in view of US Patent No. 4,011,766 to Waugh (hereinafter "Waugh"). Claims 13-14 are dependent upon independent Claims 1 and therefore also recite a power transmission belt for a motor vehicle and presenting V-ribs made of a single elastomer material and having flat side faces and rounded ridges, wherein said ridges present a convex curvilinear profile having a mean radius of curvature greater than 1 mm and less than or equal to 1.5 mm. Since independent Claim 1 is not *prima facie* obviousness, dependent claims 13-14 are also non-obvious. Applicants request withdrawal of this rejection.

## III. Conclusion

In view of the remarks made above, Applicants submit that the pending claims are in condition for allowance. Applicants respectfully request that the claims be allowed to issue. If the Examiner wishes to discuss the application or the comments herein, the Examiner is urged to contact the undersigned.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



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